Unofficial Mark Scheme Edexcel Core 2 answers only

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1. Geometric series question, prove $a = 64$ given $S_4 = 175$ and $r = \frac{3}{4}$ then workout sum to infinity. Then find the difference between the 9th and 10th term

   1 a) (2 marks) proof

   b) (2 marks) 256

   c) (2 marks) 1.602

2. Trapezium rule. $y = 8 - 2^{x-1}$ in the interval $[0, 4]$ with 4 trapeziums

   2 a) (1 mark) 7

   b) (3 marks) 20.75

   c) (2 marks) 5.75

3. Circle centred at $(7, 8)$. Find the equation of it and of a tangent at point $(10, 13)$

   3 a) (2 marks) $\sqrt{34}$

   b) (3 marks) $(x-7)^2 + (y-8)^2 = 34$

   c) (4 marks) $3x + 5y - 95 = 0$

4. where $fx = 6x^3 + 13x^2 - 4$ find the remainder when divided by $(2x + 3)$ then factorise it fully given $(x + 2)$ is a factor.

   4 a) (2 marks) 5

   b) (2 marks) $f(-2) = 0$

   c) (4 marks) $f(x) = (x + 2)(3x + 2)(2x - 1)$

5. Expansion of $(2 - 9x)^4$. The using that expand $(1 + kx)(2 - 9x)^4$ in the form $A - 232x + Bx^2$ given the coefficient of x

   5 a) (4 marks) $16 - 288x + 1944x^2$

   b) (1 mark) 16

   c) (2 marks) $\frac{7}{2}$

   d) (2 marks) 936

6. $1 - 2\cos(\theta - \frac{\pi}{5}) = 0$ solve for θ and $4\cos^2 x + 7\sin x - 2 = 0$

   6 i) (3 marks) $\frac{8\pi}{15}$or $\frac{-2\pi}{15}$

   ii) (6 marks) 345.5° or 194.5°

7. This was $\int(3x - x^{\frac{3}{2}})dx$ and then find the limits (where it crossed the x axis.

   7 a) (3 marks) $\frac{3}{2}x^2 - \frac{2}{5}x^{\frac{5}{2}} + c$

   b) (3 marks) 24.3

8. $\log_3(3b + 1) - \log_3(a - 2) = -1$, write b in terms of a then find x given $2^{2x+5} - 7(2^x) = 0$.

   8 i) (3 marks) $b = \frac{a-5}{9}$

   ii) (4 marks) -2.19

9. Find optimum perimeter of a funny shape which comprised a rectangle, sector and a equilateral triangle, need diagram.

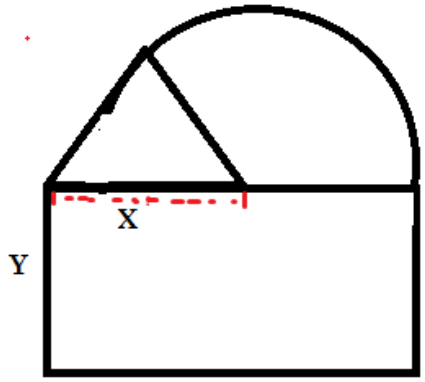

   Image by Cake_Chan Equations given, that needed proving are,

   $y = \frac{500}{x} - \frac{x}{24}(4\pi + 3\sqrt{3})$ and $P = \frac{1000}{x} + \frac{x}{24}(4\pi + 36 - 3\sqrt{3})$

   9 a) (2 marks) $\frac{\pi x^2}{3}$

   b) (3 marks) proof of the $y =$ equation

   c) (3 marks) proof of the $p =$ equation

   d) (5 marks) $x = 16.63$ $P = 120$m

   e) (2 marks) $f''x = 0.437 > 0 \therefore$ is a minimum at x